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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
OWENS, DOUGLAS W	
ART UNIT	PAPER NUMBER
2811	

DATE MAILED: 12/01/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/685,625	SCHMIDT, DAVID	
	Examiner	Art Unit	
	Douglas W Owens	2811	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *7-12* is/are allowed.

6)☒ Claim(s) *1-6,13-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *10/10/03*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1 – 4 and 6 are rejected under 35 U.S.C. 102(b) as being anticipated by US Patent No. 6,016,002 to Chen et al.

Regarding claim 6, Chen et al. teach an apparatus (Fig. 6) including an electrostatic discharge protection structure with a diac, comprising:

one or more reference electrodes (required for connection to substrate at 208 and 214);

a circuit electrode (required for connection to substrate at 192 and 194);

a semiconductor material (172) of a first conductivity type in electrical communication with the reference electrodes;

a first semiconductor region (214) of a first conductivity type disposed on said semiconductor material and in electrical communication with one of the reference electrodes;

a second semiconductor region (208) of a second conductivity type disposed on said semiconductor material proximate said first semiconductor region and in electrical communication with one of the reference electrodes;

a first semiconductor well (174) of second conductivity type disposed in the semiconductor material;

a second semiconductor well (176) of first conductivity type disposed in the first semiconductor well;

a third semiconductor region (194) of the first conductivity type disposed on the second semiconductor well and in electrical communication with the circuit electrode; and

a fourth semiconductor region (192) of the second conductivity type disposed on the second semiconductor well and in electrical communication with the circuit electrode.

Regarding claim 2, Chen et al. teach an apparatus, wherein:

he first conductivity type comprises P-type; and

the second conductivity type comprises N-type.

Regarding claim 3, Chen et al. teach an apparatus, wherein:

each of the semiconductor material, the second semiconductor well, and the first and third semiconductor regions has a respective dopant concentration; and

the first and third semiconductor region dopant concentrations (both p+) are greater than said semiconductor material (p-) and second semiconductor well dopant (p) concentrations respectively.

Regarding claim 4, Chen et al. teach an apparatus, wherein the semiconductor material comprises a substrate for an integrated circuit.

Regarding claim 6, Chen et al. teach an apparatus, wherein the circuit electrode comprises a signal interface for the integrated circuit.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al. as applied to claim 1 above, and further in view of US Patent Application Publication No. 2004/0217425 to Brodsky et al.

Chen et al. do not teach an apparatus, wherein the semiconductor material is disposed on an integrated circuit substrate. Brodsky et al. teach an apparatus, wherein the semiconductor material (epitaxial layer) is disposed on an integrated circuit substrate (paragraph [0044]). It would have been obvious to one of ordinary skill in the art to incorporate the teaching of Brodsky et al. into the apparatus taught by Chen et al., since it is desirable to form devices in high quality silicon, such as an epitaxial layer.

5. Claims 13 – 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brodsky et al. in view of Chen et al.

Regarding claim 13, Brodsky et al. teach an apparatus (Fig. 5A, for example) comprising:

one reference electrode (GND);

a circuit electrode (pin2);

a semiconductor material (60) of a first conductivity type in electrical communication with the reference electrode;

a semiconductor layer of second conductivity (62) disposed in the semiconductor material;

a first semiconductor well (64) of said second conductivity disposed on said semiconductor layer;

a second semiconductor well (66) of said first conductivity type disposed in said first semiconductor well;

a [third] semiconductor region (70) disposed on said semiconductor well and in electrical communication with the circuit electrode; and

a [fourth] semiconductor region (68) of the second conductivity type disposed on the second semiconductor well and in electrical communication with sad circuit electrode.

Brodsky et al. do not teach a semiconductor material of a first conductivity type in electrical communication with the reference electrodes and a first semiconductor region of a first conductivity type disposed on said semiconductor material and in electrical communication with one of the reference electrodes. Chen et al. teach a semiconductor material (172) of a first conductivity type in electrical communication with the reference electrodes and a first semiconductor region (214) of a first conductivity type disposed on said semiconductor material and in electrical communication with one of the reference electrodes. It would have been obvious to one of ordinary skill in the art to incorporate

the teaching of Brodsky et al. into the device taught by Chen et al. since it is desirable to conduct excess negative and positive potential to ground.

Regarding claim 14, Brodsky et al. teach an apparatus, wherein:

the first conductivity type is P-type; and

the second conductivity type is N-type.

Regarding claim 15, Brodsky et al. teach an apparatus, wherein:

each of the semiconductor material (p-), the second semiconductor well (p) and third semiconductor region (p+) has a respective dopant concentration. Brodsky et al. do not teach the first semiconductor region. Chen et al. teach the first semiconductor region (p+). It would have been obvious to one of ordinary skill in the art to incorporate the teaching of Chen et el. into the apparatus taught by Brodsky et al. for reasons discussed above. The resulting proposed invention would have first and third region dopant concentrations greater than the semiconductor material and second semiconductor well dopant concentrations.

Regarding claim 16, Brodsky et al. teach an apparatus, wherein the semiconductor material comprises a substrate for an integrated circuit.

Regarding claim 17, Brodsky et al. teach an apparatus, wherein said semiconductor material is disposed on the integrated circuit substrate (paragraph [0044]).

Regarding claim 18, Brodsky et al. teach an apparatus, wherein the circuit electrode comprises a signal interface for said integrated circuit.

Allowable Subject Matter

6. Claims 7 – 12 are allowed.

7. The following is a statement of reasons for the indication of allowable subject matter: The prior art of record does not teach, alone or in combination, including a third well of a first type in a second well of the second type, which is disposed in a first well of the second type.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Douglas W Owens whose telephone number is 571-272-1662. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie C Lee can be reached on 571-272-1732. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Douglas W. Owens
Patent Examiner